

Daily Report

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Intro

On Friday after finishing the report of parallel coordinates view, I was working on the journal submission of CVM 2013. From Saturday to Sunday I mainly focused on Attic while I finished an initial version of MDS scatter-plot view of visual SVM.

Research

The initial version of scatter-plot has been finished. The color mapping is now synchronized with parallel coordinates view, however some interactions like selecting points and cooperation with the PCP view are still under construction. There are some results shown in figure 1 and 2.

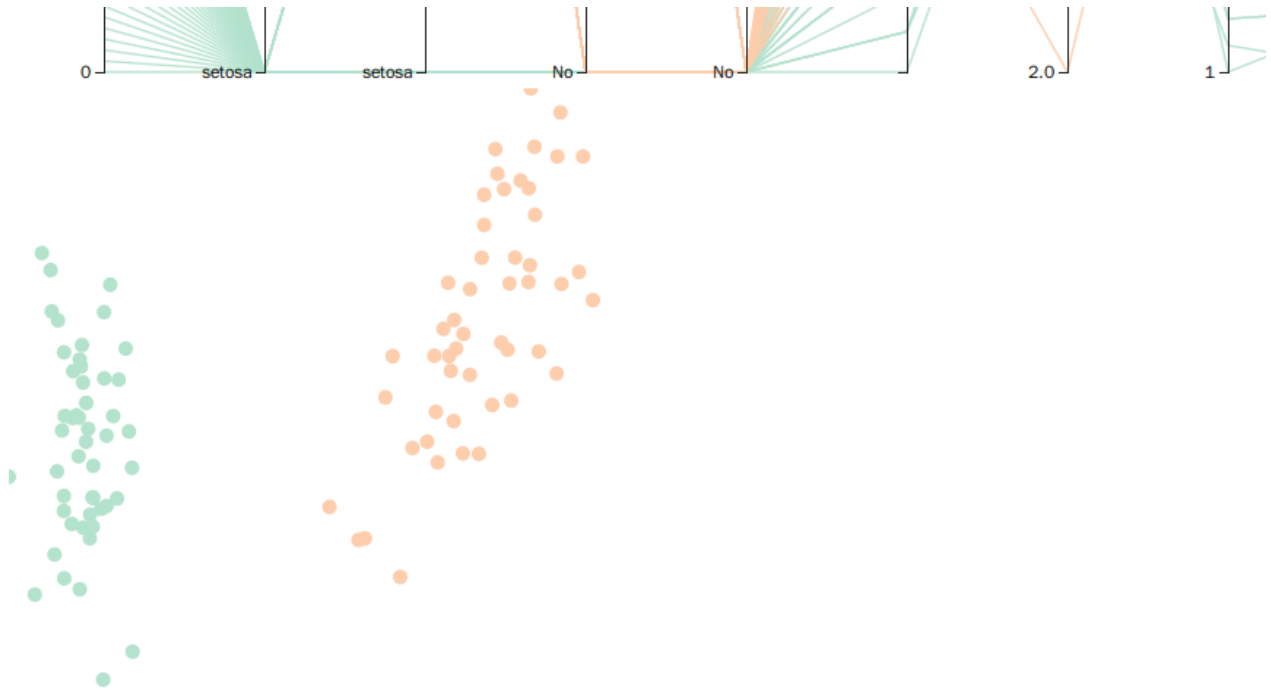


Figure 1: MDS scatter-plot with two-class color mapping. The metric of similarities between data instances are Euclidean Distance. Each point on the scatter-plot represents a data instances. It seems that the current dataset is quite easy to be classified as the two classes of dots are separated apparently.

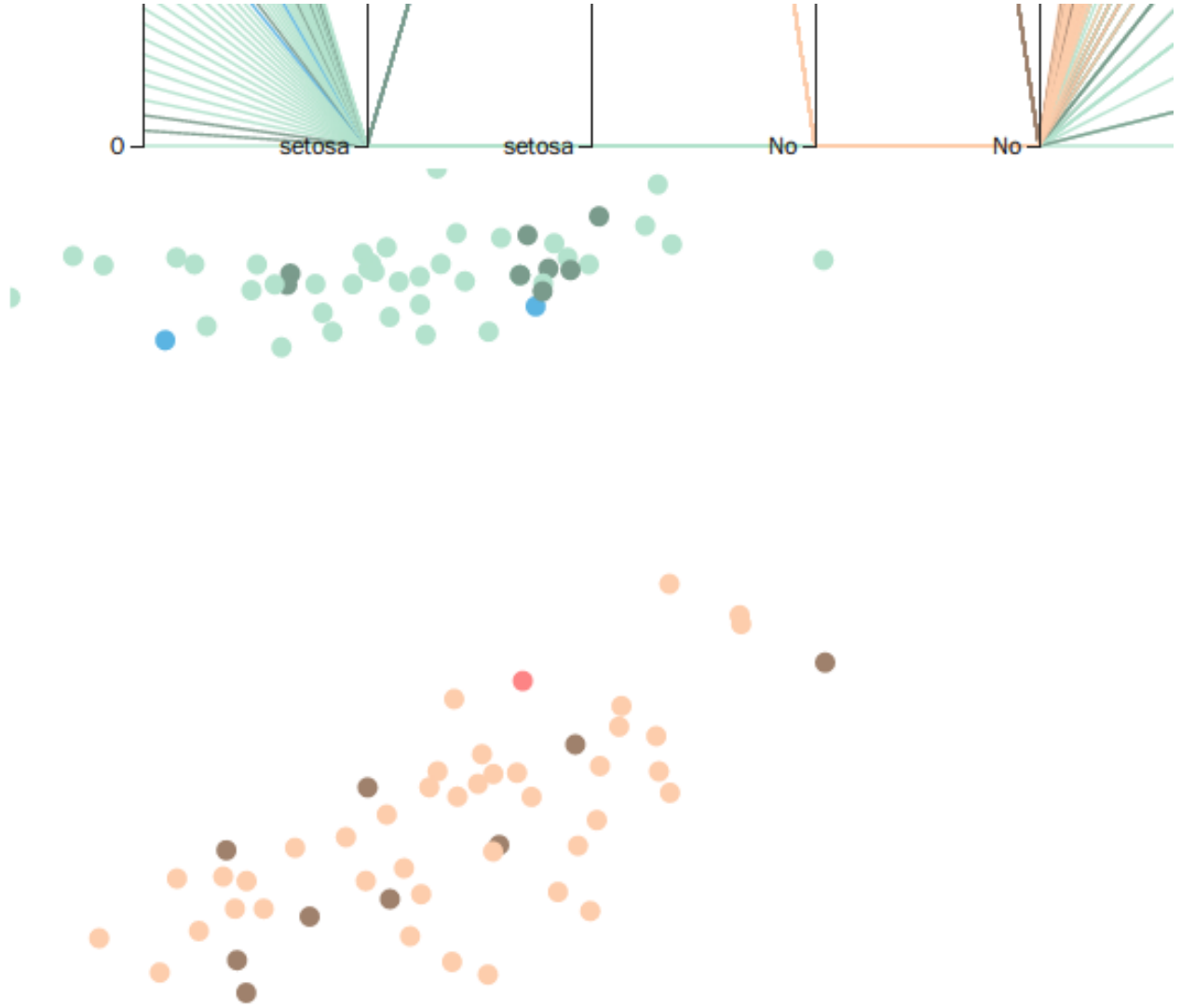


Figure 2: MDS scatter-plot with all color mapping on. Points with darker color are training data, while blue and red points are support vectors of their own class. It is obvious that the support vectors are relatively the points closest to the separating boundary of two classes. However this result may be due to the linear kernel used in current SVM settings and relatively low dimension of the dataset (4 dimensions). It is necessary to perform further investigation on more complex datasets and SVM settings. [1] introduced a similar method of generating views like this scatter-plot. I am planning to see if it is available to use there method here.

Attic

Saturday there was a meeting to discuss details about data-visual object binding panel. Also there are two more basic modules, Visual Object Manager and Scene Manager, that needs to be implemented first before any work on GUI. Xinxin and Fangzhou and I will be in charge of these two modules in the following week.

Plan for Tomorrow

- There are some more features necessary to added to the scatter-plot, including synchronizing highlighting with the PCP view, interactions of selection, coordinate axes and global layout of the views.
- furthermore, the background Python server needs to be refactored now to get a better structure as well as support more dataset and more tuning features of SVM.
- For Attic, the implementation of Visual-Object factory class can be started now, however scene manager together with kernel scene tree needs more design in the following days.

References

- [1] D. Caragea, D. Cook, and V. G. Honavar, “Gaining insights into support vector machine pattern classifiers using projection-based tour methods,” in *KDD '01: Proceedings of the seventh ACM SIGKDD international conference on Knowledge discovery and data mining*, ACM Request Permissions, Aug. 2001.